John "Jack" Woodall PhD was a consultant for the WHO/SEARO 2011 Goa workshop on yellow fever.

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Eating raw liver, a potential risk factor of crimean-Congo hemorrhagic fever (CCHF) occurrence in high-risk occupations in Nur County, Northern Iran

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Background: Eating raw lamb or beef liver is of interest to some people such as livestock farmers, shepherds, butchers and chefs. This high risk practice can cause gastrointestinal problems such as parasitic diseases and microbial infection of the liver tissue and also causes transmission of Crimean-Congo Hemorrhagic Fever (CCHF) to humans. CCHF cases occurrence in a butcher and a farmer in Nur County, raised the necessity to check the background of high risk behavior related to the consumption of raw liver in individuals who work in livestock and meat industry. This can help prevention of the disease in high-risk occupation groups.

Methods & Materials: In 2012, a cross-sectional study on 314 people, including livestock farmers, butchers, abattoir workers, chefs and veterinary staff was undertaken in three district of the Nur County. The practice of eating raw liver in different high risk occupation groups was recorded in a standard questionnaire through interview. The relevance of this high risk behavior with qualitative variables by Chi-square test and binary logistic regression were analyzed at the significant level of 0.05.

Results: The odds ratio (OR) of raw liver eating was significantly higher in livestock farmers and animal keepers than other occupations (OR = 15.27, CI: 2.04-114.32), in the mountains than plains and woodland areas (OR = 3.47, CI: 1.66-7.29) and in Baladeh district than other districts including Central and Chamestan District of the County (OR = 2.49, CI: 1.14-5.42), respectively. Additionally, consumption of raw liver in 30-39 year old age group was higher than other age groups (OR = 2.06, CI: 0.81-5.22), it was higher in rural population than urban residents (OR = 1.79, CI: 0.72-4.46) . The prevalence of this behavior in mountainous areas and Baladeh District of Nur County may be explained by the high frequency of traditional animal husbandry and unsafe slaughtering, low literacy levels, difficulty in implementing policies on health education in rural areas away from the County.

Conclusion: People attempt to eat raw liver in high risk occupational groups can increase the risk of CCHF and even its epidemic in the region.

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Outbreak of prototheca wickerhamii algaemia and sepsis in a tertiary care chemotherapy oncology unit

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Background: *Prototheca* is an emerging, rare, opportunistic, pathogenic, achlorophyllous green alga known to cause Protothecosis which is a zoonotic disease. Earlier interpreted as contaminants in blood and faeces, *Prototheca* is expanding its pathogenicity and host range. An outbreak of Protothecosis by *Prototheca wickerhamii* in a tertiary care chemotherapy oncology unit is being discussed.

Methods & Materials: All patients detected to have algaemia were operationally included in the case definition. Clinicodemographic profile, diagnosis, duration of stay, treatment protocol and neutrophil count were correlated. After isolation on sheep blood and Sabouraud's agars, urease, Germ tube formation and automated identification through VITEK 2 (bioMérieux, France) were attempted. Colony characteristics, micromorphology, substrate utilization and antifungal susceptibility were interpreted. All patients were initiated on liposomal amphotericin B (5 mg/kg body weight/day). Fecal cultures of affected patients, environmental surveillance and healthcare staff were screened while continuing surveillance for one year post outbreak.

Results: The outbreak lasted approximately 50 days during which the average occupancy was 26 patients (86.67%) and mean hospital stay was 60 days. Mean age of affected patients was 37 $\pm$ 10.74 years with male: female:: 5: 1. Mean neutrophil count in affected patients was 150 per dl. The attack rate was 7.69. *Prototheca wickerhamii* was isolated on sheep blood and Sabouraud's agars as yeast-like colonies having Gram positive 3-11 μ non-capsulated spherical yeast-like cells without budding and pseudohyphae. All isolates were negative for urease and Germ tube formation. VITEK 2 compact provided 99% identification probability. MICs in μg/ml for Amphotericin B and Voriconazole were 0.5 and 2 respectively. All isolates were similar for biochemical reactions and susceptibility patterns. All patients responded to liposomal amphotericin B. One patient detected to have algaemia went into sepsis with serum procalcitonin levels between 2-4 ng/ml with subsequent fatal outcome under intensive care. Surveillance studies were not contributory.

Conclusion: Immunocompromised neutropenic patients having Protothecosis may not manifest clinical features leaving detection to intuitive clinical acumen. Outbreaks are difficult to detect and control as incubation period is variable. Such hospital outbreaks re-emphasize the need to strengthen hospital and laboratory based surveillance to ensure adequate preparedness, rapid detection and response to outbreaks.

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